



magnecord

RECORDER/REPRODUCER

1021

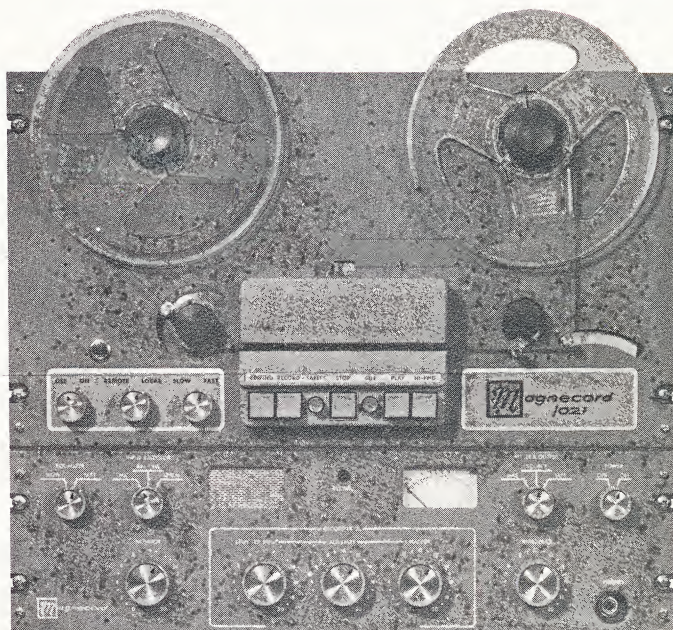
new Transistorized

If you were going to build a tape recorder for Broadcasters, you'd think it logical to ask them what they needed. We did and they told us. You'll find the things they wanted in the New Magnecorder Model 1021.

For example, they wanted smooth tape handling and smooth braking. The New Magnecorder model 1021 is as smooth a machine as you'll ever see, even with the thinnest tapes.

You'll also find Broadcast standard connectors, standard impedances and standard levels. There is a cue-ing speaker with a separate volume control, and its amplifier will drive an external speaker. There is provision for phones too. And there's a mixing input with a separate gain control, in case you want to mix — or make echoes.

ONLY
\$659⁰⁰



You can "one-hand" cue this fine recorder. The "cue" button lifts tape to the heads, releases the brakes and puts low even torque on the reels. You can remote start-stop the recorder in a pre-set mode, with nothing more complicated than a single pole single throw switch.

The new Magnecord model 1021 has all of the standard features you expect to find in a top notch recorder, plus a host of others that will surprise and please you. See the list on the back of the page.

You don't have to be a Broadcaster to buy a New Magnecorder model 1021. Just be one who can appreciate that the 1021 is the very best monaural recorder at any price for any use. The 1021 will prove the wisdom of your judgement. Made in the U. S. A.

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MIDWESTERN INSTRUMENTS

P. O. Box 7509

Tulsa, Oklahoma, 74105

Area Code 918-NAtional 7-1111

TWX 918-627-6030



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SPECIFICATIONS

TAPE SPEEDS: 3.75 and 7.5 inches per second.

FLUTTER AND WOW: 0.25% at 3.75 ips; 0.2% at 7.5 ips.

TIMING ACCURACY: $\pm 0.2\%$.

REEL SIZE: 5-, 7- and 8-inch E.I.A. hubs.

REWIND TIME: 1200 feet in 80 seconds.

FREQUENCY RESPONSE – OVERALL
RECORD/REPRODUCE:

35 to 8,000 cps ± 2 db at 3.75 ips;

45 to 18,000 cps ± 2 db at 7.5 ips.

SIGNAL-TO-NOISE RATIO: 53 db, both speeds.

INPUTS PER CHANNEL: Lo-Z microphone, balanced bridge, unbalanced bridge, mixing bridge and auxiliary bridge.

OUTPUTS PER CHANNEL: 150/600-ohm balanced, auxiliary A and auxiliary B unbalanced (+4 dbm).

HEADS: Full-track Erase, Record and half-track Play.

WEIGHT: Transport 33 pounds.

Amplifier 14 pounds.

DIMENSIONS: Transport, 19" wide, 10½" high, 7¼" deep;
Amplifier, 19" wide, 5¼" high, 12" deep;
Transport Reel Overhang, 1¾".

PRICE: \$659.00.

ACCESSORIES: Transport Carrying Case, \$30.00.
Amplifier Carrying Case, \$30.00.

1021

FEATURES

- Fully transistorized with regulated power supply
- Standard readily available transistors and components
- Switchable equalization (N.A.B. standard)
- Broadcast standard input and output connectors
- In-built cue-ing speaker with separate level control
- New "Cue" transport control
- Two speed hysteresis synchronous capstan motor
- Separate reel drive motors
- Military type differential band brakes
- Simultaneous record and playback
- In-built input and output transformers (adjustable impedance)
- Front panel input selector
- Mixing auxiliary input
- Monitoring from tape or source
- Modular construction
- Auxiliary unbalanced outputs
- Durable, easily cleaned and easy-on-the-eye vinyl finish
- Large "Operator" type knobs

- Earphone monitoring
- V.U. meter for record and playback level measurement
- Solid die cast transport top plate
- Remote "Start-Stop"
- Local-Remote front panel switch
- Pushbutton, transport controls
- Record safety interlock
- Large rugged hardened stainless steel capstan
- Ball bearing inertial stabilizer
- Pay out compliance arm and tape break shut-off
- Capstan motor stops when tape runs out
- Take-up compliance arm
- Superior tape guiding
- Double flywheel capstan drive
- Signal switching available at remote socket
- Solenoid operated tape gate, brakes and pressure roller
- Handles half mil tape safely – without stretching
- Position for fourth head available
- Made in the U.S.A.

IMPORTANT - THIS TECHNICAL INFORMATION: C-502, 142, 146
11/64 E-514

WAS REQUESTED BY:

Mr. T. Nelson, Sys. Consult.
Box 1546 C
Poughkeepsie, New York 12603

Here is the information you requested.

If you need additional data, we have attached a self-addressed postage-paid post card listing all Switchcraft literature. Check off the catalogs you wish and return the card. The literature will be forwarded to you by return mail.

All Switchcraft products are sold nationally through leading electronic parts distributors.

Should you desire technical application assistance, kindly contact either our office directly or our Sales Representative listed below.

Thank you

OUR REPRESENTATIVE IN YOUR AREA IS:

O. F. Masin Inc.
92 North Ave.,
New Rochelle, N.Y.

Phone NE--61000

SWITCHCRAFT
INC.

5555 N. ELSTON AVE. • CHICAGO 30, ILL.
774-1515 • TWX 312 265-1314

QUALITY PRODUCTS THROUGH ADVANCED ELECTRO-MECHANICAL RESEARCH

FORM NO. GL-332



MIDWESTERN INSTRUMENTS

T U L S A , O K L A H O M A 7 4 1 0 5

TWX: 918-627-6030
WIRE: FAX : FCB
PHONE: National 7-1111

41st & Sheridan Rd.
WRITE: P. O. BOX 7509

Dear Friend:

Thank you for your inquiry about *M*agnecord products. The information you requested is enclosed.

You will find that our products are built with painstaking care to the highest standards of quality, so they will render long and reliable service.

Our products are carefully and fairly priced so that they represent an excellent buy for the money.

To assist you in preserving the high-quality performance of your investment our factory is equipped with a fine Service Department ready to maintain your *M*agnecord instrument and to supply spare parts when necessary. In addition, there is a nationwide network of well-informed, authorized service stations to implement factory service.

For further information or assistance, please call on us or our sales representative in your area. The enclosed sales representative sheet will help you locate your regional sales representative.

Sincerely,

*M*AGNECORD Sales Department
MIDWESTERN INSTRUMENTS, INC.

James S. Arrington
James S. Arrington
Sales Manager

JSA/sjr

Encl.

MIDWESTERN INSTRUMENTS

sales representatives



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MIDWESTERN INSTRUMENTS

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Area Code 918-NAtional 7-1111

TWX 918-627-6030



ENGINEERING*bulletin*

August 20, 1963

Reference Catalogs
E-508, 122, 126

Grounding in Audio Frequency Connectors

A reprint from Special Report on Electronics

Audio frequency connectors are not only widely used in recording, public address, broadcast and communication applications, but they are also finding use in test instrument systems. Certain connector requirements are common to both sound and instrumentation uses.

It is our purpose here to examine briefly one important aspect of audio frequency connectors—grounding. First we will speak about the role connector grounding plays. Then we will discuss some overall connector design considerations. And lastly, we will look at those design features which provide high quality ground contact.

Connector Grounding Function

Shielded cable minimizes the pickup of noise and spurious signals by the cable connecting a transducer (microphone or test probe) to the equipment input. It is essential that the cable shielding be connected to the chassis ground of the equipment through a contact that is as close to zero resistance as possible. If the connector's ground contact has appreciable resistance, the noise current flow in the shield would produce an undesirable voltage drop across the contact.

Since this noise voltage is introduced at a low level stage, a system with high gain will amplify the

spurious signals so that it may be quite troublesome at the output. A good connector ground contact is necessary for low cable noise.

Intermittent grounding can be even worse than a high resistance contact since it produces noise pulses and transients in the process of making and breaking contact. A good connector ground must be firm and constant.

Another advantage of reliable and effective ground connection is protection against shock hazard should full line voltage be applied to the connector shell through conductor shorting or circuit error. It is interesting to note how some electronic specialists improperly employ audio connectors to carry line voltage when it is a dangerous practice that is not recommended.

Connector Design Considerations

Basically, five elements constitute an audio frequency connector. As shown in the connector photo of Fig. 1 and the cutaway view of Fig. 2, there is the coupling or locking section which engages and holds the mated connector and receptacle. A latch locking mechanism which provides rapid, yet positive locking, is illustrated.

The shell holds the connector elements together and protects the connections within.

The contact part of the connector is usually an arrangement of metal pins which mate with the female receptacle.

The insert, generally made of diallyl phthalate, holds the em-

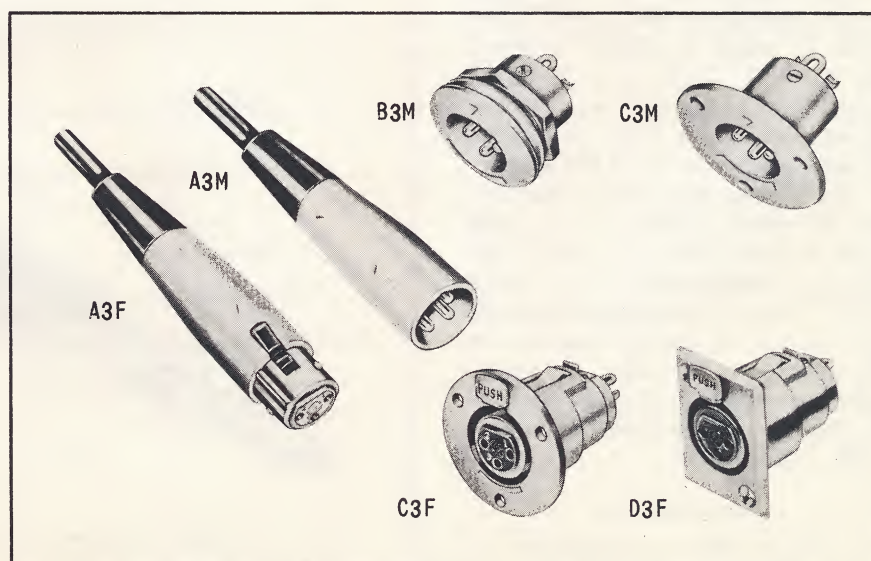


Fig. 1—Spring-mounted ground contactor presses against inside of receptacle shell when mated.

bedded pins and terminals in firm position.

A cable clamping arrangement, generally incorporating a strain relief as shown, holds the connector firmly to the cable and relieves the terminal points to which the conductors are soldered of strain.

For proper contact of ground terminal to shell, the various connector elements must be held firmly in place. Connector contact is then dependent on the material used and the design. Basically, a large, smooth contact surface is desired to provide the greatest current-carrying capacity for a given contact size. However, where the contact surface is corroded or coated with an oxide layer that is not a very good conductor, a surface that is not perfectly smooth may be preferred when wiping contacts are used. That is, the small, sharp projections on the surface may serve to break through the poorly conducting layer to make effective metal-to-metal contact. Dependence on these small projections for contact will limit current-carrying capacity since the cross-section area of these projections is small.

Mating male and female connectors must be readily separable. Furthermore, even the multi-pin insert in the connector shell should be capable of being taken out of the shell to facilitate soldering conductors to the pin terminals. Therefore, ground contact between the shield (or ground wire) pin connection and the connector shell, as well as shell-to-shell contact between male and female connector sections, must depend on firm contact pressure.

How much pressure is needed often depends on the contact material. To obtain a contact resistance of less than 0.1 ohm in a connector, gold and platinum may require about 30 grams of force, while nickel and silver may need 300 grams.

The greater the pressure, the lower the contact resistance is a useful rule of thumb. Screws permit much higher pressure than, say, spring clips. However, screws are obviously not suited for readily separable or breakaway connections. In separable connections, designers resort to spring action contacts, preferably with wiping action.

Unique Connector Grounding Feature

How ground contact requirements are fulfilled may be appreciated by referring to the photos of audio frequency connectors made by Switchcraft. Certain design features make special provision for effective ground contact.

There are two set screws in the top-center of the male connector. The left screw holds the neoprene strain relief bushing. The other screw is in a threaded hole in the ground terminal to which the cable shield or grounding wire may be soldered. The screw head slot is accessible through a hole in the connector shell. This hole is smaller than the diameter of the screw. When the screw presses up against the shell, not only is the diallyl phthalate insert containing the pins held firmly in place, but the ground terminal connection to the metal shell is made with a high pressure screw contact.

An interesting point about this insert screw is that it is lefthand-threaded. That is, when the user wants to tighten the insert in the shell and make ground contact, the screw is turned clockwise, just as one would turn any conventional screw to tighten it. However, this clockwise turning tightens by partly unscrewing from the threaded ground terminal and pressing forc-

bly against the rim of the access hole in the shell. Incidentally, this screw design eliminates one of the most annoying problems engineers encounter with audio connectors—losing set screws. The screw simply cannot be removed, much less fall out, unless the entire pin-terminal insert is first taken out of the shell. Substantial pressure from the screw assures good contact from the ground terminal to the shell.

The next step is to provide good contact between the shells of the two mating connectors, or between the connector shell and receptacle mounted on the equipment panel. The illustrations show a female connector and male receptacle which panel mounts in a single hole with a conventional hex nut. This nut may be tightened with a readily available wrench or pliers, and does not require a spanner wrench or special tool to make high pressure ground contact between the nickel finish shell and equipment panel.

The front of the connector shows two shell-mounted ground contactors, one on either side of the latch-lock and keyway guide. These leaf spring indentations wipe against the inside of the receptacle shell during mating, providing effective shell-to-shell ground contact.

It is anticipated that ground contact provisions will play an increasing role in determining audio frequency connector design.

